

CLAIMS

We claim:

1. A method for treating water comprising the steps of:
 - a) providing at least two treatment tanks, each tank defining a water treatment compartment containing water treatment material including carbon;
 - b) communicating a source of water to be treated with at least one of said treatment tanks;
 - c) passing said water to be treated through said one treatment tank;
 - d) determining when said one tank requires regeneration;
 - e) upon determining that said one tank requires regeneration, terminating said communication of said source with said one tank and effecting regeneration of said one tank, said regeneration including the step of passing an oxidant solution through said one treatment tank, said oxidant solution being drawn from a reservoir.
2. The method of claim 1, wherein said step of determining when said one tank requires regeneration comprises the step of monitoring the quantity of water passed through said one treatment tank.
3. The method of claim 1, wherein said carbon comprises catalytic carbon.
4. The method of claim 1, wherein said step of passing said oxidant solution through said one treatment tank occurs in a counterflow direction for a predetermined time.
5. The method of claim 1, wherein said regeneration

further includes the steps of:

a) the terminating the flow of oxidant solution from said reservoir; and,

b) passing water through said treatment tank in a counterflow direction for a predetermined time sufficient to flush said treatment tank of said oxidant solution.

6. The method of claim 3, further comprising the step of passing water through said treatment tank in a counterflow direction for a predetermined time, prior to initiation of said regeneration in order to fluff the catalytic carbon prior to regeneration.

7. The method of claim 1, wherein said oxidant solution is a bleach solution.

8. The method of claim 1, wherein said oxidant solution is a hydrogen peroxide solution.

9. The method of claim 7, wherein said bleach solution is in the range of about 2% to about 15% sodium hypochlorite.

10. The method of claim 8, wherein said hydrogen peroxide solution contains hydrogen peroxide in the range of about 2% to about 35%.

11. The method of claim 1, further comprising the step of communicating said source of water to be treated with said other tank during regeneration of said one tank.

12. A method for treating water comprising the steps of:

a) providing at least one treatment tank having a

water treatment compartment containing water treatment material including carbon;

b) communicating a source of water to be treated with said tank;

c) passing said water to be treated through said treatment tank in order to remove a substance from said water;

d) determining when said tank requires regeneration; and,

e) upon determining that said tank requires regeneration, terminating said communication of said source with said tank and effecting regeneration of said one tank, said regeneration including the step of passing an oxidant solution through said treatment tank, said oxidant solution being drawn from a reservoir.

13. The method of claim 12, further comprising the step of providing another treatment tank and communicating source water to said other treatment tank when said one tank is being regenerated.

14. A method for treating water, comprising the steps of:
a) providing at least two treatment tanks, each tank defining a water treatment compartment containing water treatment material including a carbon bed;

b) communicating a source of water to be treated with at least one of said treatment tanks, while isolating the other treatment tank from said source of water to be treated;

c) passing said water to be treated through said one treatment tank in a first direction until it is determined that said one treatment tank requires regeneration;

d) upon determining that said one tank requires regeneration, terminating said communication of said source of

water with said one tank and communicating said source of water to be treated with said other tank;

e) effecting regeneration of said one tank by:

i) passing water through said one treatment tank in a counterflow direction for a predetermined time in order to fluff said carbon bed;

ii) conveying an oxidant solution from a reservoir to said one tank and passing said solution through said carbon bed in a counterflow direction for a predetermined time;

iii) terminating said flow of oxidant solution and rinsing said one treatment tank by passing water through said carbon bed in a counterflow direction until said oxidant solution is flushed from said carbon bed;

iv) passing water through said carbon bed in said first flow direction for a predetermined time sufficient to compact the bed.

15. A method of removing a substance containing sulfur, from water comprising the steps of:

a) providing at least two treatment tanks, each tank containing a water treatment material including carbon;

b) providing a controller for controlling the communication of source water to be treated with said tanks, said controller controlling when a treatment tank is on-line and when a treatment tank is off-line;

c) providing a reservoir of oxidant solution and a mechanism to control a regeneration of an off-line tank;

d) placing one of said treatment tanks on-line;

e) passing water through said one treatment tank;

f) monitoring water usage and placing said one tank off-line when it is determined that said one tank requires regeneration;

g) regenerating said one tank by drawing said oxidant solution from said reservoir and passing it through said one tank.

16. The method of claim 15, wherein said other tank is on-line when said one tank is being regenerated and the regeneration of said one tank further includes the step of rinsing said one tank by passing treated water discharged by said other tank through said one tank.

17. The method according to claim 16, wherein the drawing of said oxidant solution from said reservoir is achieved using a venturi to which treated water from said other tank is communicated during regeneration of said one tank.

18. The method according to claim 16, wherein the oxidant solution in said reservoir is drawn through a restrictor.

19. A method for removing a substance containing sulfur, from water comprising the steps of:

- a) providing a treatment tank containing a treatment bed that includes carbon;
- b) providing a controller for controlling the communication of source water to be treated with said tank and for controlling the regeneration of said tank when regeneration is needed;
- c) passing water to be treated through said treatment tank in order to remove said substance;
- d) monitoring water usage to determine when said tank requires regeneration;
- e) providing a reservoir of oxidant solution;
- f) terminating the communication of said source water

with said tank when it is determined that regeneration of said tank is required;

g) regenerating said tank by drawing oxidant solution from said reservoir and passing it through said tank;

h) rinsing said tank with a rinse water to flush said oxidant solution from said tank.

20. A water treatment apparatus, comprising:

a) at least two water treatment tanks each defining a fluid flow path including a compartment containing carbon through which water to be treated is passed;

b) a controller for controlling the communication of water to be treated with said tanks;

c) a monitor for determining when an on-line tank needs to be taken off-line and regenerated; and,

d) a regeneration controller including valving for communicating an oxidant solution from a reservoir to an off-line tank.

21. The apparatus of claim 20, wherein said oxidant solution is drawn from said reservoir through a restrictor comprising a capillary tube.

22. The apparatus of claim 21, wherein a check valve is located upstream of said capillary.

23. The apparatus of claim 21, wherein a venturi located upstream of said capillary dilutes the oxidant solution to a predetermined level.

24. The apparatus of claim 21, wherein a filter is located downstream of said capillary.

25. The apparatus of claim 20, further comprising a means for fast rinsing said off-line tank in a service direction, said fast flow rinse means including a differential pressure operated purge valve that is responsive to fluid pressures applied to inlet and outlet valves associated with each water treatment tank.

26. A water treatment apparatus, comprising:

- a) a water treatment tank defining a fluid flow path including a compartment containing catalytic carbon through which water to be treated is passed;
- b) controller for controlling the communication of water to be treated with said tank;
- c) monitoring means for determining when the tank requires regeneration; and,
- d) regeneration controller including valving for communicating an oxidant solution from a reservoir to the tank when regeneration is required.

27. The apparatus of claim 26, wherein said oxidant solution is drawn through a restrictor.

28. The apparatus of claim 27, wherein said restrictor comprises a capillary tube.

29. The apparatus of claim 28, wherein a check valve is located upstream of said capillary tube.

30. The apparatus of claim 28, wherein a venturi located upstream of said capillary tube dilutes the oxidant solution to a predetermined level.

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